

25. (New) An optical filter device comprising:

an optical waveguide layer having a width and length significantly greater than a thickness, wherein said optical waveguide layer is divided by a groove into a first part and a second part; and

a filter element including a liquid crystal layer disposed in said groove to divide light in said optical waveguide layer in a waveguide direction, said liquid crystal layer having a twisted structure in which a helical pitch reflects light of a predetermined wavelength to remain within said first part of said optical waveguide layer, and permits light of a different predetermined wavelength to pass through said filter element to said second part of said waveguide layer.

26. (New) An optical filter device according to claim 25, wherein said filter element is formed by filling a liquid crystal material before curing into the groove which is formed in said optical waveguide layer, and then curing the liquid crystal material.

27. (New) An optical filter device according to claim 25, wherein said liquid crystal layer is formed by stacking a clockwise polarized layer and a counterclockwise polarized layer.

28. (New) An optical filter device according to claim 25, further including a photodiode, a laser diode, and a monitor photodiode on the silicon substrate.